Commodity Highlight: Processing Tomatoes

The United States is the second leading producer of tomatoes for all uses, ranking second only to China. Following potatoes, tomatoes are the most highly valued processing vegetable in the United States. However, processing tomatoes have historically accounted for a smaller share of all tomato cash receipts due to a low value per pound. While fresh tomatoes are typically valued at 25 to 35 cents per pound at the farm, processing tomatoes are valued at about 3 cents per pound. As a result, processing tomatoes account for just one-third of all tomato cash receipts despite a crop size that is 5 to 6 times greater than that for the fresh-market.

According to the 2002 Census of Agriculture, 70 percent of U.S. tomato acreage is harvested for processed products. This acreage is harvested by 1,577 farms—just 8 percent of all U.S. farms producing tomatoes. Ten percent of the farms producing processing tomatoes account for two-thirds of the area harvested. About 45 percent of U.S. area harvested for processing tomatoes comes from farms planting at least 1,000 acres of tomatoes.

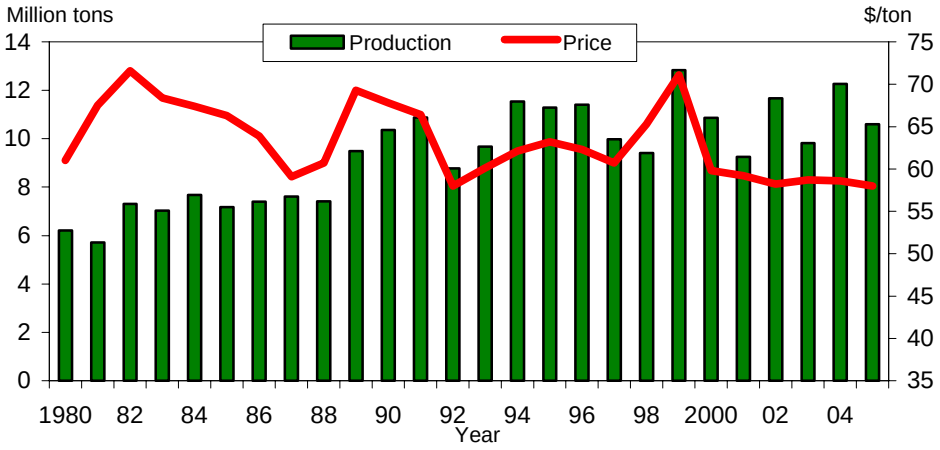
Unlike many other countries where tomatoes are produced, the fresh and processing tomato industries largely comprise separate markets in the United States. Four basic characteristics distinguish the two industries:

- Tomato varieties are bred specifically to serve the requirements of either the fresh or the processing markets. Processing requires varieties that contain a higher percentage of soluble solids (averaging 5 to 9 percent) to efficiently make products such as tomato paste;
- Most tomatoes grown for processing are produced under contract between growers and processing firms. Fresh tomatoes are largely produced and sold on the open market;
- Virtually all processing tomatoes are machine-harvested, while all fresh-market tomatoes are hand-picked;
- Fresh-market tomato prices are higher and more variable than processing due to larger production costs and greater market uncertainty.

Over the past several decades, the processing tomato industry has been moving westward. California has long been the primary source of processed tomato products in the United States and, by itself, leads all individual nations of the world

Figure 4

U.S. processing tomatoes: Production and season-average price



Source: National Agricultural Statistics Service, USDA, except 2005 forecast by ERS.

in terms of production of tomatoes for processing. In 2004, California accounted for 95 percent of the area harvested for processing tomatoes in the United States—up from 87 percent in 1990 and 79 percent in 1980. Harvest of the California processing tomato crop is most active August to September, with around two-thirds of the crop produced in Fresno, Yolo, and San Joaquin Counties. Texas, Utah, Illinois, Virginia, and Delaware once harvested thousands of acres, but today they have little or none. About 20,000 acres remain spread across Indiana, Ohio, Michigan, Pennsylvania, and New Jersey, with Indiana and Ohio planting the majority of the acreage.

U.S. per-acre yields for processing tomatoes continue to trend higher, moving from 14.5 short tons per acre in 1960 to a record 40.8 tons in 2004. Improved production and harvest technologies (including improved seed varieties), plus the shift of production from low-yielding states to California (where yields are strong) accounted for much of the gain in yields. Since 1980 (when yield was 23.6 tons), yield has trended higher by about 1,200 pounds per acre annually.

Growers sign contracts with processors to process red-ripe tomatoes. According to industry estimates, the cost of raw tomatoes represents about 45 percent of the total cost of producing tomato paste (energy and containers are the next most important costs, at 10 percent of the total). Although many firms manufacture pulp-based products, such as stewed and diced tomatoes, most initial processing is by firms that manufacture industrial tomato paste—the basic raw ingredient in the industry. Paste is manufactured and packed in bulk containers—large bags in boxes and barrels—and stored for use up to 18 months later. This raw ingredient is distributed under contract or sold to remanufacturing firms that add water, spices, etc. to make retail and food-service packs of soups, sauces, catsup, juices, and paste.

The late 1980s and early 1990s ushered in an era of structural change within the U.S. processing tomato industry. Relatively high prices for tomato products in the late 1980s brought new investment in tomato-processing facilities in California. The resulting surge in supply overwhelmed the market, causing prices to decline and forced several higher-cost processors to close or consolidate in the early-to-mid 1990s.

In the past, many firms made paste and also remanufactured this paste into other products. In California, there remain around 20 firms engaged in processing tomatoes, with a few others outside the state. The industry appears to be polarizing with several firms specializing in the manufacture of industrial paste and bulk diced

Table 23--U.S. processing tomatoes: Acreage, yield, production, and value

Year	Acreage 1/		Yield	Produc-tion	Farm value	
	Planted	Harvested			Per unit 2/	Crop 3/
	--1,000 acres --		Tons/acre	1,000 tons	$/ton	Mil. dols.
1990	366.7	354.7	29.19	10,355	67.80	702,367
1995	359.5	344.4	32.77	11,285	63.20	713,479
2000	309.3	289.6	37.49	10,858	59.80	649,066
2001	279.9	274.9	33.65	9,249	59.20	547,473
2002	317.5	312.2	37.38	11,671	58.20	679,823
2003	310.0	293.9	33.41	9,820	58.70	576,441
2004	321.2	300.6	40.80	12,266	58.60	719,285
2005 3/	286.9	278.3	38.30	10,659	58.00	618,200

f = forecast.

Source: National Agricultural Statistics Service, USDA except 2005 from ERS, USDA.

tomatoes, and others specializing in the remanufacture of industrial paste into consumer products. At least three California firms are also producing various dried and dehydrated tomato products such as whole dried tomatoes and tomato powder.

Exports are becoming an important component of the U.S. processing tomato industry. During the early 1990s, the United States became a net exporter of processed tomato products and has remained so since. About 5 percent of tomato product supply was exported during the 1990s—up from 1 percent the previous 2 decades. Exports, which rose to a record 7 percent of supply during 1997 and 1998, are averaging around 6 percent of supply in the new millennium. Top U.S. export markets include Canada (which takes about half of all volume), Japan, Mexico, and South Korea. Generally, tomato sauces account for the largest share of exports, followed by paste, catsup, and canned whole products.

According to ERS estimates, nearly 6 percent of the tomato products consumed by Americans in 2004 were imported. During the 1990s, imports averaged about 4 percent of consumption, down from 7 percent during the 1980s. In most years, Canada is the largest exporter to the United States, accounting for about a quarter of imported processed tomato products—the majority of which consists of catsup. Other important sources of tomato products are Chile, Mexico, Italy, and Israel. In years with short crops, tomato paste can account for a significant share of import volume; however, sauces and catsup are usually the top tomato product imports.

After bottoming out in 1981 at the close of a downturn that began in the mid-1970s, U.S. consumption of processed tomatoes began a steady climb that accelerated in the late 1980s with the rising popularity of pizza, pasta, and salsa. ERS estimates suggest the largest processed use of tomatoes is in sauces (35 percent), followed by paste (18 percent), canned whole tomato products (17 percent), and catsup and juice (each about 15 percent). Domestic use surged heading into the 1990s but leveled off as the decade progressed, averaging 74.4 pounds per capita (fresh-weight basis) during the 1990s—up 17 percent from the 1980s. Reflecting periods of weaker economic activity and changes in consumer preferences, consumption thus far during the 2000s has remained about 7 percent below the average of the 1990s (hovering around 70 pounds per capita, fresh-weight basis). According to a USDA food consumption survey, about a third of all processed tomato products are purchased away from home at various foodservice outlets (e.g., pizza parlors).

Table 24--U.S. processing tomatoes: Supply and disappearance 1/

Year	Supply				Utilization			
	Production 2/	Imports 3/	Jan 1 stocks 4/	Total	Exports 3/	Dec 31 stocks 4/	Domestic	Per capita use
	-- Million pounds --							Pounds
1970	11,018	696	9,655	21,369	105	8,528	12,736	62.1
1980	12,421	206	9,746	22,373	333	7,442	14,598	63.6
1990	20,711	1,070	11,350	33,130	789	13,503	18,838	75.3
2000	21,717	591	16,262	38,570	2,231	16,532	19,806	70.1
2001	18,497	1,107	16,532	36,136	2,410	15,030	18,696	65.5
2002	23,342	1,517	15,030	39,888	2,458	17,454	19,976	69.3
2003	19,639	1,153	17,454	38,246	2,936	15,003	20,307	69.8
2004	24,533	1,283	15,003	40,819	2,990	17,129	20,700	70.4
2005 f	21,300	1,296	17,129	39,725	3,080	15,369	21,277	70.8

f = ERS forecast. 1/ All volume data in this table is expressed on a fresh-weight equivalent basis. 2/ Source is National Agricultural Statistics Service, USDA. 3/ Source of product-weight data (converted by ERS) is Bureau of the Census, USDC. 4/ Estimated by ERS based on data from the California League of Food Processors.

For more information on tomatoes for processing, see:

http://www.ers.usda.gov/Publications/vgs/

http://www.ers.usda.gov/briefing/tomatoes/

http://usda.mannlib.cornell.edu/data-sets/specialty/92010/

Proc table 12--Processing tomatoes: U.S. acreage, yield, production, and value, 1990-2005

Year	Acres planted	Acres harvested	Yield	Production	Value per ton	Crop value
	Acres		*Tons/acre*	*Short tons*	*$/ton*	*1000 $*
1990	366,710	354,700	29.19	10,355,260	67.80	702,367
1991	367,610	355,980	30.54	10,872,990	66.40	722,114
1992	277,110	273,910	32.04	8,777,430	58.00	509,413
1993	316,400	307,470	31.47	9,676,667	60.10	581,901
1994	347,540	340,060	33.93	11,539,710	62.10	716,469
1995	359,480	344,380	32.77	11,285,007	63.20	713,479
1996	345,390	339,140	33.64	11,407,301	62.30	711,043
1997	293,720	283,390	35.19	9,973,259	60.70	604,905
1998	302,560	299,960	31.34	9,402,010	65.30	613,954
1999	359,120	350,410	36.63	12,836,020	71.10	912,988
2000	309,300	289,600	37.49	10,858,240	59.80	649,066
2001	279,930	274,860	33.65	9,248,720	59.20	547,473
2002	317,500	312,200	37.38	11,670,820	58.20	679,823
2003	310,030	293,920	33.41	9,819,710	58.70	576,030
2004	321,230	300,620	40.80	12,266,410	58.60	719,285
2005 f	286,900	278,293	38.30	10,658,622	58.00	618,200

f = ERS forecast.

Source: National Agricultural Statistics Service, USDA.

Proc table 13--Processing tomatoes: State acreage, yield, production, and value, 2000-2005

Year	Acres planted 1/	Acres harvested	Yield	Production	Value per ton	Crop value
	Acres		*Tons/acre*	*Short tons*	*$/ton*	*1000 $*
California						
2000	289,000	271,000	37.96	10,286,500	58.60	602,789
2001	258,000	254,000	34.02	8,640,140	57.50	496,808
2002	296,000	291,000	37.99	11,056,000	56.80	627,981
2003	289,000	274,000	33.77	9,252,000	57.20	529,214
2004	301,000	281,000	41.54	11,672,000	57.40	669,973
2005f	265,000	265,000	38.87	10,300,000	57.00	587,100
Indiana						
2000	7,600	6,600	34.70	229,020	84.10	19,261
2001	8,600	8,000	31.39	251,120	88.80	21,546
2002	8,200	8,100	31.66	256,450	86.10	22,080
2003	8,400	8,200	24.67	202,290	86.80	17,559
2004	8,400	8,300	33.11	274,810	85.80	23,579
2005f	7,900	7,900	30.46	240,650	85.00	20,455
Michigan						
2000	3,000	2,800	30.00	84,000	81.00	6,804
2001	3,300	3,100	34.00	105,400	80.00	8,432
2002	3,700	3,600	35.00	126,000	83.00	10,458
2003	3,400	3,300	38.00	125,400	83.00	10,408
2004	3,600	3,500	31.00	108,500	81.00	8,789
2005f	--	--	--	--	--	--
Ohio						
2000	5,800	5,400	29.39	158,710	78.70	12,490
2001	6,370	6,200	26.55	164,610	80.30	13,218
2002	6,400	6,300	23.75	149,630	80.60	12,060
2003	6,400	5,700	30.40	173,280	77.60	13,447
2004	6,600	6,200	28.60	177,320	78.40	13,902
2005f	6,400	6,400	25.94	166,000	78.00	12,948
Others						
2000	3,900	3,800	26.32	100,010	77.21	7,722
2001	3,660	3,560	24.56	87,450	85.40	7,469
2002	3,200	3,200	25.86	82,740	87.60	7,244
2003	2,830	2,720	24.54	66,740	87.10	5,813
2004	1,630	1,620	20.85	33,780	90.10	3,042
2005f	4,600	4,600	29.80	137,100	89.00	12,202

-- = included in other. f = NASS April forecast of contract area and ERS value forecasts.

Source: National Agricultural Statistics Service, USDA.